

INTERNATIONAL PRELIMINARY EXAMINATION REPORT  
(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference T 103 260 WO	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/EP 03/13012	International filing date (day/month/year) 20.11.2003	Priority date (day/month/year) 26.11.2002
International Patent Classification (IPC) or both national classification and IPC G01N27/411		
Applicant SPECIALTY MINERALS (MICHIGAN) INC. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
  - ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:
  - I ☒ Basis of the opinion
  - II ☐ Priority
  - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV ☐ Lack of unity of invention
  - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI ☐ Certain documents cited
  - VII ☐ Certain defects in the international application
  - VIII ☐ Certain observations on the international application

Date of submission of the demand  24.06.2004	Date of completion of this report  29.04.2005
Name and mailing address of the International preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  Klein, M-O  Telephone No. +49 89 2399-2736 

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP 03/13012

## I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

### Description, Pages

1-4, 7-14 as originally filed  
5, 6 received on 14.04.2005 with letter of 12.04.2005

### Claims, Numbers

1-16 received on 14.04.2005 with letter of 12.04.2005

### Drawings, Sheets

1/2-2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	1-16
	No: Claims	
Inventive step (IS)	Yes: Claims	1-16
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-16
	No: Claims	

2. Citations and explanations

**see separate sheet**

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Reference is made to the following document:

D1: GB-A-1 594 223

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**Claim 1:**

**D1** discloses a probe for the measurement of the hydrogen activity of metal melts (fig. 1, abstract), in particular steel melts, comprising a reference substance (5) of known hydrogen activity in electrically conducting contact with a measuring device; and comprising a solid electrolyte (4) predominantly hydrogen ion conducting and negligibly electron conducting at high temperatures and separating the reference substance (5) from the metal melt and having an entry surface for hydrogen ions which is in contact with the metal melt, wherein the entry surface of the probe ready for operation is covered by a functional foil arrangement ((156); p. 2, l. 17-33) in close contact to the entry surface (fixed by an adhesive).

The difference between the subject-matter of claim 1 and **D1** is that

- the functional foil arrangement is tightly pressed against the entry surface over its extension from outside by *mechanical means*, and
- an oxygen activity is measured with the participation of a solid electrolyte with predominantly oxygen ion conductivity<sup>1</sup>.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

Therefore the resulting technical effect is that the mechanical attachment of the foil to the solid electrolyte does not need a glueing step (and therefore a drying step for the fixation of the glue. Furthermore, it is easy to exchange the foil by another if a damage of the foil is noticed. This is not easily possible if the foil is glued to the solid electrolyte. The problem to be solved by the present invention may be regarded as to modify the existing probe that it supports the above described technical effect.

<sup>1</sup>

this additional feature is not considered to be inventive over **D1** because oxygen and hydrogen are two common gas to be measured in molten metals.

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The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reason:

None of the cited prior-art documents gives any hint in a direction that would solve the above stated technical problem. Either an adhesive is used for the fixation of the foil to the solid electrolyte or a protecting coating is covering the solid electrolyte.

Claim 15:

For reasons analogous to those given above the subject-matter of claim 15 is considered new and inventive because the fixation of the functional foil by mechanical means like an elastomeric shrinking hose is not anticipated by any cited prior-art document.

Dependent claims

Claims 2-14,16 are dependent on claims 1, 15 and as such also meet the requirements of the PCT with respect to novelty and inventive step.